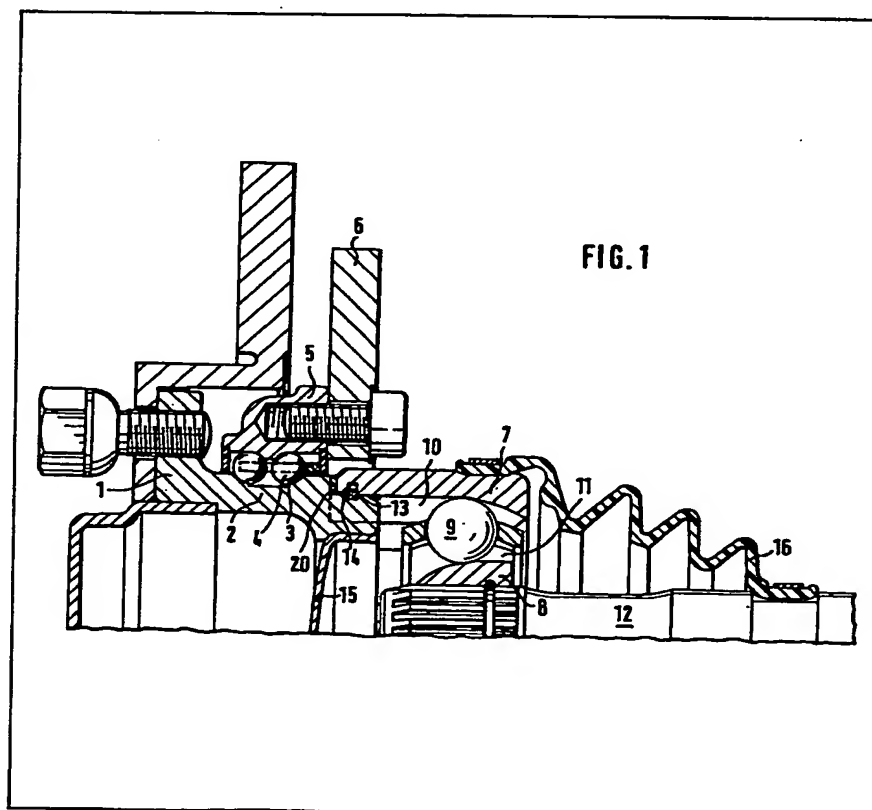


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- (71) Applicants
Uni-cardan AG
(FR Germany),
Alte Lohmarer Str 59,
5200 Siegburg,
West Germany
- (72) Inventors
Alfons Jordan
Werner Krude
- (74) Agents
G. M. Dodd, B. Thorpe,
B. C. Robertson,
Guest Keen and
Nettlefolds plc,
Group Patents and
Licensing Department,
PO Box 55,
Cranford Street,
Smethwick,
Warley,
West Midlands B66 2RZ

(54) Wheel hub assembly

(57) In a hub assembly for a drivable vehicle wheel, with a hub member 1, a bearing 2-5, and a constant velocity ratio universal joint, torque is transmitted between the hub member and the outer member 7 of the universal joint by a part 14 of the hub member which projects into the joint member and has a cross-sectional shape which interfits with the internal cross-section of the joint member. Particularly, the hub member has projections which engage in grooves 10 in the joint member which also receive the torque transmitting balls of a ball type joint. The members are secured together axially by a spring ring 13.



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FIG. 1

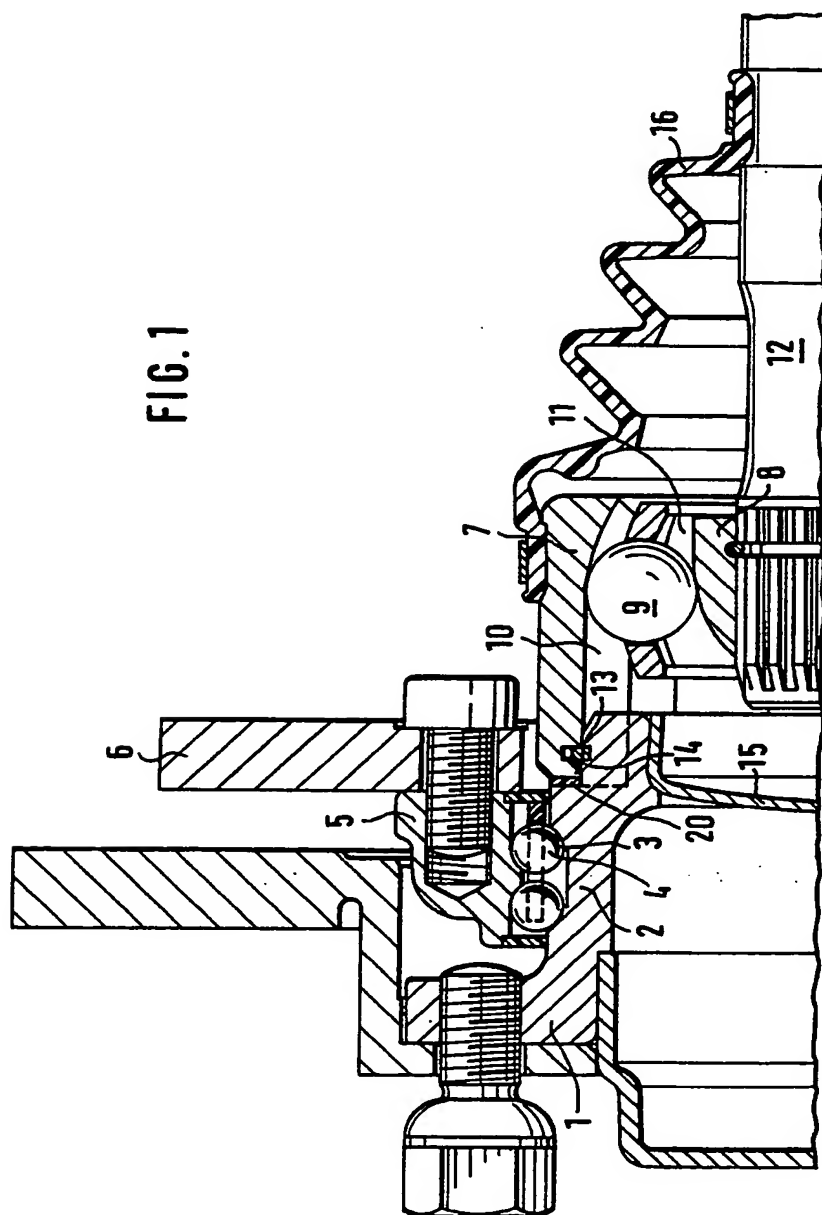


Fig 1

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FIG. 2

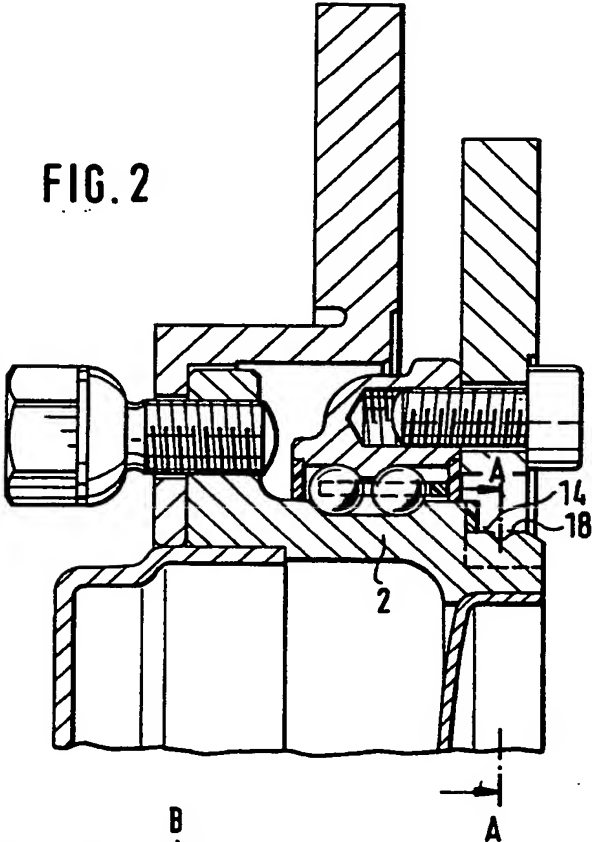
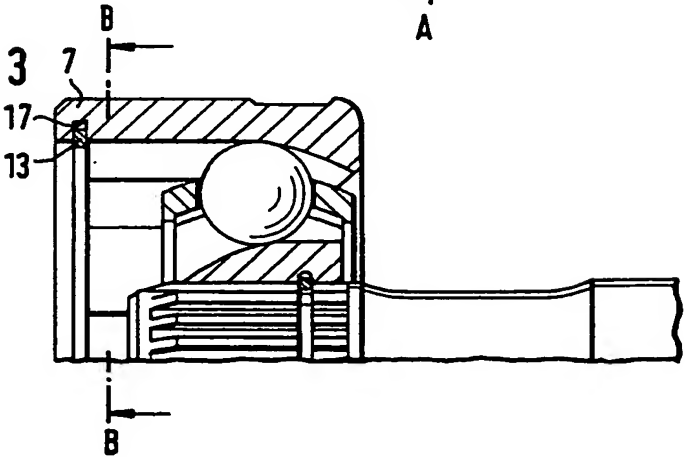


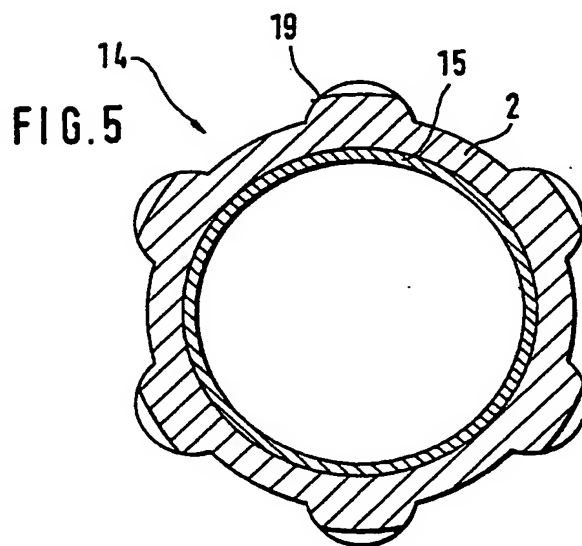
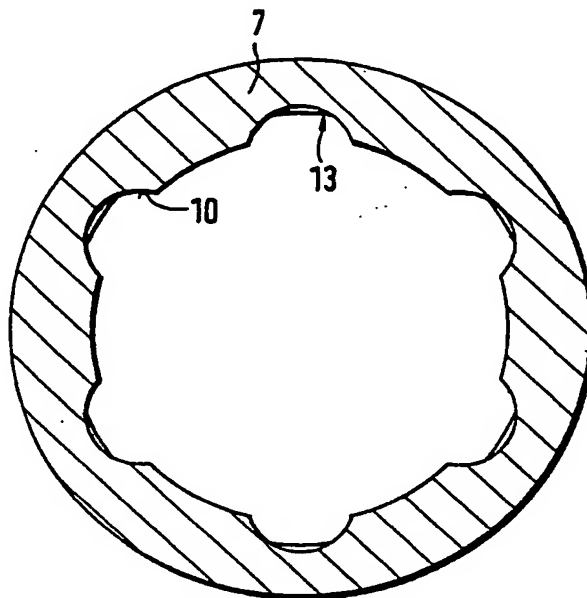
FIG. 3



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FIG. 4



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SPECIFICATION

Hub assembly

- 5 This invention relates to a hub assembly for a drivable wheel of a vehicle, the assembly comprising a hub member, bearing means supporting the hub member for rotation and having an inner race formed or carried on the hub member, and a hollow
- 10 outer member of a constant velocity ratio universal joint connected to the hub member for torque transmission therewith.

- It has been proposed, in German patent specification 1,931,300, that in such an assembly torque can be transmitted between the hub member and joint
- 15 outer member by interfitting axially extending teeth on the joint member, hub member, and the inner race of the bearing which is a separate component between the joint member and hub member. However, in such an assembly it is difficult to ensure
- 20 concentric running of the individual components, and large forces have to be accommodated by the teeth, especially between the inner bearing race and hub member. A further disadvantage of the assembly is the larger number of components utilized.

- It is the object of the present invention to provide a hub assembly in which the above referred to disadvantages are overcome or reduced, and which is relatively simple both in manufacture and assembly.

- 30 According to the invention, the hub assembly has a part of the hub member which projects into the joint outer member and has a cross-sectional shape which interfits with the internal shape thereof for torque transmission, and there is provided securing
- 35 means for holding the hub member and joint member together axially.

- An advantage of such a design is that by having the hub member interfitting with the internal cross-sectional shape of the joint outer member, it is not
- 40 necessary to provide axially extending teeth or the like on these components. The assembly thus can have a relatively small dimension in the axial direction.

- When the universal joint is of the type in which the
- 45 outer joint member has grooves in its interior which receive balls for torque transmission, the hub member may have projections which engage in the grooves in the outer joint member.

- The advantage of this feature is that no special measures are required in the production of the joint
- 50 outer member. It is advantageous to use this design in cases where the grooves in the outer joint member extend in straight lines parallel to the axis of rotation of the joint member, or are curved and
- 55 occupy meridian planes or are of undercut free shape. Assembly is easily achieved by sliding the outer joint member onto the part of the hub member.

- The securing means may comprise a spring ring
- 60 engaging circumferentially extending recesses in the hub member and joint outer member.

- The hub member may have an internal bore closed by a closure member, and there may be provided sealing means effective between the joint
- 65 outer member and hub member. To seal the uni-

versal joint, there is then additionally required only a sealing boot, connected between the outer joint member and a drive shaft connected to the inner member of the joint.

- 70 The invention will now be described by way of example, with reference to the accompanying drawings, of which:-

Figure 1 is a section through a hub assembly according to the invention;

- 75 Figure 2 is an enlarged section of part of Figure 2; Figure 3 is a section showing the universal joint only of the assembly of Figure 1;

Figure 4 is a transverse section on B-B of Figure 3; Figure 5 is a transverse section on A-A of Figure 2.

- 80 The hub assembly of Figure 1 comprises a hub member 1 with a part 2 which forms the inner race of a double row angular contact ball bearing. The inner bearing race part 2 has grooves 3 which receive balls 4, which in turn engage an outer race 5 of the bearing bolted to a flange 6, which can be supported by
- 85 an appropriate suspension component or components of a vehicle in which the hub assembly is to be used. The hub member 1 carries a brake disc and is adapted to have a wheel secured to it.

- 90 Connected to the hub member for torque transmission therewith is a constant velocity ratio universal joint, comprising an outer member 7, an inner member 8, and a plurality of balls 9 engaging in opposed grooves 10, 11 in the outer and inner joint members respectively. A drive shaft 12 having a splined end portion is received in a splined bore in the inner joint member, and a flexible sealing boot 16 is connected between the outer joint member 7
- 95 and drive shaft 12.

- 100 The torque transmitting connection between the hub member 1 and outer member 7 of the universal joint is established by a part 14 of the hub member adjacent the part 2 thereof which forms the inner bearing race, which fits within an end part of the joint outer member. The part 14 of the hub member has a cross-sectional shape which includes projections 19 (shown more clearly in Figure 5) which fit
- 105 within the grooves 10 of the outer joint member for torque transmission.

- 110 The hub member and joint outer member are held together axially by a spring ring 13 which engages an annular groove or recess 18 in the part 14 of the hub member and an annular groove 17 in the joint outer member. The form of the grooves in the members, and the spring ring 13, intersecting the bases of the grooves in the joint outer member and the crests of the projections 19 on the hub member, is clearly seen in Figures 4 and 5.

- A seal is established between the joint outer
- 120 member and hub member by a sealing ring 20 engaged between the end of the joint outer member and an axially presented annular surface on the hub member. A closure member 15 is press-fitted in the interior of the hub member, so that the universal joint is completely sealed against escape of lubricant and ingress of dirt.

CLAIMS

1. A hub assembly for a drivable wheel of a vehicle, comprising a hub member, bearing means supporting the hub member for rotation and having an
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- inner race formed or carried on the hub member,
and a hollow outer member of a constant velocity
ratio universal joint connected to the hub member
for torque transmission therewith, wherein part of
5 the hub member projects into the joint outer
member and has a cross-sectional shape which
interfits with the internal shape thereof for torque
transmission, and there is provided securing means
for holding the hub member and joint member
10 together axially of the assembly.
2. A hub assembly according to Claim 1 wherein
said outer joint member has grooves in its interior
which receive balls for torque transmission with an
inner joint member, and wherein said part of the hub
15 member has projections which engage in said
grooves.
3. A hub assembly according to Claim 1 or Claim
2 wherein said securing means comprises a securing
ring engaging annular recesses in said joint member
20 and hub member.
4. An assembly according to any one of the pre-
ceding Claims comprising means for establishing a
seal between said hub member and joint outer
member.
- 25 5. An assembly according to Claim 4 wherein
said hub member is hollow and has a closure
member in its interior.
6. A hub assembly substantially as hereinbefore
described with reference to the accompanying draw-
30 ings.

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